WHAT IS CLAIMED IS:

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1. A stent graft, comprising:

a tubular prosthetic graft;

a support structure expandable between a contracted condition for facilitating introduction into a blood vessel, and an enlarged condition for securing the graft across a weakened region of the blood vessel; and

a biosensor attached to at least one of the graft and the support structure.

2. The stent graft of claim 1, wherein the biosensor is directly attached to an outer surface of the graft.

3. The stent graft of claim 2, wherein the biosensor is attached to the graft by sutures or an adhesive.

4. The stent graft of claim 1, wherein the biosensor is directly attached to struts comprising the support structure.

5. The stent graft of claim 1, wherein the support structure comprises a self-expanding stent.

6. The stent graft of claim 1, wherein the support structure comprises a balloon-expandable stent.

7. The stent graft of claim 1, wherein the biosensor is attached to at least one of the graft and the support structure by a filament.

8. The stent graft of claim 1, wherein the filament is configured to dispose the biosensor beyond an outer surface of the stent graft.

9. The stent graft of claim 1, further comprising a plurality of filaments extending from an outer surface of the stent graft to the biosensor, thereby attaching the biosensor to the stent graft.

10. The stent graft of claim 9, wherein the plurality of filaments are attached to the stent graft at one or more predetermined locations, and the filaments have predetermined lengths, whereby when the support structure is expanded to its enlarged condition, the filaments substantially secure the biosensor at a predetermined position on the stent graft.

11. The stent graft of claim 1, wherein the biosensor is a sensor selected from the group consisting of a pressure sensor, a temperature sensor, a pH sensor, a blood sugar sensor, a blood oxygen sensor, a motion sensor, a flow sensor, a velocity sensor, an acceleration sensor, a force sensor, a strain sensor, an acoustics sensor, a moisture sensor, an osmolarity sensor, a light sensor, a turbidity sensor, a radiation sensor, an electromagnetic field sensor, a chemical sensor, an ionic sensor, and an enzymatic sensor.

12. An apparatus for treating an aneurysm within a blood vessel, comprising:

a stent graft comprising a tubular graft, and an expandable support structure;

a biosensor attached to the stent graft by one or more filaments;

an elongate member including a proximal end and a distal end adapted for introduction into a blood vessel, the distal end including a distal region for receiving the stent graft in a contracted condition and the biosensor adjacent one another thereon; and

a constraint for securing the stent graft to the distal region of the delivery device.

13. The apparatus of claim 12, wherein the elongate member comprises a nose portion on the distal end, the nose portion defining a cavity for receiving the biosensor therein when the stent graft is received on the distal region.

14. The apparatus of claim 13, wherein the constraint comprises a sheath slidable between an extended position wherein a distal end of the sheath engages the nose portion, and a retracted position wherein the stent graft is exposed on the elongate member.

15. The apparatus of claim 14, wherein the sheath comprises a tongue extending distally from its distal end, the tongue being configured to extend into the cavity of the tapered nose portion when the sheath is disposed in its extended position, the tongue substantially securing the biosensor within the cavity.

16. A method for treating an aneurysm within a blood vessel of a patient, the aneurysm including an enlarged weakened region extending between two healthy regions, the method comprising:

introducing a stent graft in a contracted profile state into the patient's blood vessel, the stent graft including a biosensor attached thereto;

advancing the stent graft in the contracted profile state until it is oriented across the weakened region; and

expanding the stent graft from the contracted profile state towards an expanded profile state such that ends of the stent graft engage the healthy regions to substantially isolate a cavity at least partially defined by the enlarged weakened region from the blood vessel, and such that the biosensor is disposed within the cavity.

17. The method of claim 16, further comprising:

providing the stent graft in the contracted profile state on a distal region of a delivery device with the biosensor disposed adjacent the stent graft on the distal region, the delivery device including a retractable sheath overlying the stent graft;

wherein the step of expanding the stent graft comprises withdrawing the sheath from over the stent graft.

18. The method of claim 17, wherein the stent graft is biased to assume the enlarged profile state, and wherein the stent graft automatically expands towards the enlarged profile state when the sheath is withdrawn.

19. The method of claim 18, wherein the biosensor is attached to the stent graft by one or more filaments, and wherein

the biosensor is pulled into the cavity as the stent graft automatically expands when the sheath is withdrawn.

20. The method of claim 16, wherein the biosensor is attached to the stent graft by a plurality of filaments fixed to predetermined positions on the stent graft, whereby the biosensor is disposed at a predetermined location on an outer surface of the stent graft when the stent graft is expanded.

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